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Population

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14. ABSTRACT The overriding objective of this research is to reduce hazardous drinking in a military sample by implementing two motivational interventions and comparing them to a treatment-as-usual condition. Individuals who are referred to the Air Force Alcohol and Drug Abuse Prevention and Treatment (ADAPT) program as the result of an alcohol incident or who are self-referred are randomly assigned to one of three interventions: (1) a group motivational intervention, (2) an individual motivational intervention, or (3) a treatment-as-usual group. All participants provide data regarding drinking and related problems at baseline and at 3, 6, and 12 months following the interventions. Analyses focus on (1) determining the effectiveness of the interventions in reducing alcohol use and alcohol-related problems, (2) testing factors that may mediate or moderate responses to the interventions, and (3) determining the cost and cost-effectiveness of treatment. The research includes a large sample and an extended follow-up on intervention effects, components that most previous intervention studies have lacked. From a practical perspective, the ability to classify which individuals will benefit from a motivational intervention has important military readiness and alcohol policy implications.					
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1. Introduction and Objectives

Alcohol abuse has been a long-standing problem in the military. The Armed Services have experienced problems with alcohol from the earliest days of military service, in part because heavy drinking has been an accepted custom and tradition (Bryant, 1979; Schuckit, 1977). In the past, alcohol was thought to be necessary for subsistence and morale and, as such, was provided as a daily ration to sailors and soldiers. In the predominantly male U.S. military population, heavy drinking has served as a test of “suitability for the demanding masculine military role” (Bryant, 1974, p. 133), and hard-fighting soldiers have commonly been characterized as hard-drinking soldiers. Alcoholic beverages have been available to military personnel at reduced prices at military outlets and, until recently, during happy hours on base (Bryant, 1974; Wertsch, 1991). In addition, alcohol has been used in the military to reward hard work, to ease interpersonal tensions, and to promote unit cohesion and camaraderie (Ingraham, 1984).

This study seeks to assess empirically the effectiveness of two motivational interviewing interventions (MIs) compared with treatment as usual in the Air Force Alcohol and Drug Abuse Prevention and Treatment (ADAPT) program. Follow-up assessments are planned for 3, 6, and 12 months. In addition, the study will establish cost-effectiveness indices for these interventions, providing the Department of Defense (DoD) with valuable information that will support policy and funding decisions. Findings from this study will provide information on potential interventions for use by DoD as part of its alcohol abuse reduction initiative. Specifically, the data will help inform alcohol abuse prevention strategies targeting heavy-drinking personnel. Our findings will also have important implications for DoD’s efforts to develop comprehensive plans for treating alcohol abuse among military personnel. Finally, our results will help identify avenues for further investigation. Four major objectives guide the study:

- Evaluate the short- and long-term effectiveness of two MIs with heavy-drinking military personnel. We will test the effects of an MI delivered individually and in a group format to determine whether a group condition (GMI) can produce outcomes similar to those demonstrated with individual motivational interviewing (IMI).
- Compare GMI and IMI with a treatment-as-usual control group. Results will provide information on the effectiveness of the current Air Force Substance Abuse Seminar (SAS) and a comparison with two experimental conditions.
- Test factors that may mediate or moderate responses to the interventions. These interventions are promising strategies to reduce harmful drinking in that they may trigger the change process (i.e., problem recognition, concern about drinking, and a desire to change drinking behavior). The assessment portion of the interventions will include measures of factors to be tested as mediators. Knowledge of the change process will offer a better understanding of how an MI may lead to behavioral change. A number of individual-level factors may also interact with the interventions to attenuate responses. These factors will be included in the design as potential moderators of the interventions’ effectiveness. Factors that moderate effectiveness will help identify populations for whom the interventions work.

- Assess the cost-effectiveness of the three interventions. The cost-effectiveness analysis will provide an estimate of the additional costs, relative to SAS, of achieving a given improvement in effectiveness using either of the MI approaches. The results from this analysis will allow decision makers to make fully informed treatment resource allocation decisions by weighing gains in effectiveness against any additional cost.

An evaluation of outcomes will provide a clearer understanding of the approach with the greatest benefit for military drinkers and the factors that mediate or moderate the intervention. The research includes a large sample and an extended follow-up on intervention effects, components that most previous intervention studies have lacked. From a practical perspective, the ability to classify which individuals will benefit from an MI has important military readiness and alcohol policy implications.

2. Body

2.1 Background

Almost 200,000 new personnel are recruited into active-duty military service each year, entering a force numbering about 1.4 million (DoD, 1999). Young recruits have many of the same issues and problems experienced by civilian young adults. In the civilian population, the 18-to-25 age group has the highest prevalence rates of heavy alcohol use and tobacco use (Substance Abuse and Mental Health Services Administration [SAMHSA], 2003). These high rates among civilian young adults may be exacerbated among military personnel, who are away from family and other social supports and who are facing the stresses of military life, including working in high-risk environments. Indeed, prevalence rates of heavy alcohol use are significantly higher among military personnel than civilians, particularly for males and younger enlisted personnel (Bray et al., 1999).

Alcohol use among military personnel is implicated in lowered work performance, accidents and injury, and serious problems with others and the law. These factors detract from military readiness. According to research conducted by RTI International on behalf of DoD, heavy alcohol use (defined in military studies as drinking five or more drinks per typical drinking occasion at least once a week) decreased slightly between 1980 and 1998, from 21% to 19%; nonetheless, it remains at problem levels and is particularly common among young enlisted personnel (Bray et al., 1999). High rates of heavy drinking are found among military personnel with a high school education or less (24%), those aged 20 or younger (24%), those aged 21 to 25 (26%), unmarried personnel (24%), and junior enlisted personnel (26%). In 1998, about 7% of military personnel experienced serious consequences from their alcohol use, 14% experienced productivity loss, and about 5% could be defined as dependent on alcohol. Negative effects associated with alcohol use were more common among heavy drinkers than less frequent drinkers. For example, compared with moderate drinkers, heavy drinkers were more likely to experience serious consequences from alcohol use (24% vs. 4%), productivity loss (39% vs. 9%), and symptoms of dependence (22% vs. 1%).

Since 1972, DoD has been establishing prevention and treatment policies to confront alcohol abuse and alcoholism among military personnel (DoD, 1972, 1980, 1983, 1985, 1994, 1997). In 1986, these directives were combined with broader ones to form a comprehensive health promotion policy that recognized the value of good health and healthy lifestyles for military performance and readiness (Bray et al., 2003; DoD, 1994). Under this policy, DoD directed programs toward preventing the misuse of alcohol, providing counseling or rehabilitation services to abusers, and providing education to various target audiences (Bray, Kroutil, & Marsden, 1995). The DoD Prevention, Safety, and Health Promotion Council (DoD, 1999) recently put forward a broad-based initiative to address the substantial impact of alcohol use on the military. The strategic plan seeks to reduce heavy alcohol use, promote a responsible alcohol use lifestyle and culture, promote alcohol alternatives, and deglamorize alcohol use.

An important target group for education and enforcement of DoD alcohol abuse policies is young adult personnel. Heavy alcohol use is common among young adults in the civilian household population, from whom military recruits are drawn. Findings from the 2000 National Household Survey on Drug Abuse (NHSDA) indicate that about 38% of young adults aged 18 to 25 were binge drinkers (drank five or more drinks per occasion on at least 1 day in the previous

30 days) and 13% were heavy drinkers (drank five or more drinks per occasion on 5 or more days in the previous 30 days) (SAMHSA, 2003). Both binge drinking and heavy drinking were relatively stable among young adults during the 1990s, although both increased significantly between 1997 and 1998. Heavy drinking was particularly common among young adult males (47%), Whites (43%), those with a college education (41%), and those employed full-time (41%). Heavy drinking decreased between 1999 and 2000 for those in college (from 43% to 41%) but was stable among other young adults (34%).

Research suggests that brief interventions can be effective with young adult populations (Anderson et al., 1998; Bien, Miller, & Tonigan, 1993; Marlatt et al., 1998; Miller, 2000; Monti et al., 1999). A brief intervention for alcohol use is typically defined as minimal interaction with a medical or mental health professional, focusing on the health risks associated with drinking and ranging from several minutes to several sessions. Brief interventions are particularly effective for individuals who do not have severe alcohol dependence but are drinking at harmful levels—the target population for this research. Thus, brief interventions are a cost-effective way of providing services to more individuals while saving more intensive efforts for those requiring more intensive treatment (Dimeff et al., 1999).

One of the most successful brief interventions used to date has been MI (Zweben & Zuckoff, 2002; Butler et al., 1999). MI is conceptualized as a style of therapeutic interaction that has at its core the belief that individuals are responsible for changing their (drinking) behavior and for sustaining the changed behavior (Miller & Rollnick, 1991). Because MI includes techniques that allow the individual to explore ambivalence about changing and techniques that avoid triggering defensive behaviors, this approach is particularly useful for people who are reluctant to change and/or are ambivalent about changing. MI-based approaches have demonstrated effectiveness in young adult samples (Marlatt et al., 1998; Miller, 2000; Monti et al., 1999). Because heavy-drinking military personnel are likely to be in the 18-to-25 age group, we believe that MI interventions may be effective in reducing abusive drinking behaviors in this population.

Although decision makers often find it necessary to weigh the costs required to achieve any gains in effectiveness, there is little existing published research that can be used for guidance. There is no published evidence on the cost-effectiveness of group MI. Moreover, there is no published evidence on the cost-effectiveness of similar prevention interventions conducted in the Air Force. Therefore, to help policy makers allocate treatment resources within the Air Force, a rigorous cost-effectiveness analysis of these treatment alternatives compared with treatment as usual is necessary.

2.2 Year 4 Activities

RTI was awarded this contract on March 1, 2004. Year 4 of the project has consisted of the continuing recruitment of study participants and Phase I data collection (baseline), continuing Phase II data collection (3-, 6-, and 12-month follow-ups), conducting booster MI trainings at participating installations, tape coding of MI sessions, recruiting additional participating installations, and presenting the study design and initial baseline data at the Community Prevention Division Research Meetings and the Military Health Research Forum and at two additional conferences.

2.2.1 Phase I (Baseline) Data Collection

Recruitment of study participants continued during Year 4 at Eglin AFB and Offutt AFB. Recruitment was initiated at Sheppard AFB. As of March 4, 2008, we had a total of 261 participants enrolled in the study (84 at Eglin AFB, 87 at Offutt AFB, 70 at Sheppard AFB, and 20 at RAF Lakenheath). Of the 261 total participants, 129 were enrolled in Year 4. Enrollment across intervention conditions is roughly equal with 75 in GMI, 81 in IMI, and 96 in treatment as usual (TAU)—the SAS.

The target N for the study is 675 (225 in each treatment condition). Because of staffing issues enrollment was significantly lower than expected. Specifically, at Eglin AFB the Program Manager (PM) of the ADAPT program left that position and it has been challenging to engage the new PM. Also at Eglin, a new program for ADAPT patients (i.e., ABC) has been initiated, and we are competing for nondiagnosed patients. At Offutt AFB, the PM left the position and was replaced, delaying enrollment. In addition, the new PM at Offutt deployed for 6 months during 2007, and in that time the program enrolled only seven individuals when this site had previously been one of our most active sites.

2.2.2 Phase II (Follow-Up) Data Collection

Phase II data collection commenced April 18, 2006. As of March 4, 2008, 162 follow-up surveys have been completed (83 three-month, 50 six-month, and 29 twelve-month).

2.2.3 MI Training and Booster Training

MI booster training was conducted for ADAPT staff and study personnel at Eglin AFB (June 2007) and at Offutt AFB (April 2007). Sheppard AFB was added as a study site; MI training was conducted in June 2007, and booster training was conducted in December 2007. The training and booster training included reinforcing skills needed for administering the two MI intervention conditions (IMI and GMI), as well as study procedures and requirements.

2.2.4 Tape Coding

To maintain treatment integrity throughout Phase I and across installations, IMI and GMI treatment sessions are audio-taped and rated for MI adherence. During Year 4, RTI personnel coded audio-taped IMI and GMI interventions sessions and provided feedback to therapists as needed.

2.2.5 Installation Recruitment

Installation issues have been a major obstacle in attaining the goals of this project. Since the study has begun, three installations have withdrawn from the study because of time and staffing constraints (Tinker AFB during Year 2, RAF Lakenheath and Travis AFB during Year 3).

2.2.6 Presentations

During Year 4, the following presentations were given at the Community Prevention Division Research Meetings and the Military Health Research Forum, Alcohol Policy 14, and Addiction Health Services Research conference.

Brown, J. M. & Rae Olmsted, K. (2008, January). *Group and individual motivational interventions with Air Force personnel*. Paper presented at the Alcohol Policy 14 conference, San Diego, CA.

Brown, J. M. (2007, December). *Motivational interventions to reduce alcohol use in a military population*. Paper presented at the Air Force Community Division Research Meeting, San Antonio, TX.

Cowell, A. & Brown, J. M. (2006, December). *Interventions to reduce alcohol use in a military population, cost analyses*. Paper presented at the Air Force Community Division Research Meeting, San Antonio, TX.

Cowell, A. & Matsuda, Y. (2007, October). *Motivational interventions to reduce alcohol use in a military population: Cost and effectiveness*. Paper presented at the Addiction Health Services Research, Athens, GA.

The presentation PowerPoint slides and poster are attached as **Appendix A**.

2.3 Project Schedule

Because of a much lower than anticipated participant recruitment rate and installation withdrawals, we have applied for a no-cost extension. The no-cost extension will allow us to lengthen the participant recruitment period to increase the number of participants without additional funding. The timeline for the statement of work has therefore been adjusted (see **Appendix B** for the revised statement of work).

3. Key Research Accomplishments

Accomplishments during Year 4 include the following:

- Conducted MI trainings at Sheppard AFB.
- Conducted MI booster training at Eglin AFB, Offutt AFB, and Sheppard AFB.
- Collected Phase I (baseline) data on 129 participants.
- Collected additional Phase II (follow-up) data (39 3-month, 21 6-month, and 28 12-month assessments).
- Presented the outcome and cost data at the Community Prevention Division Research meetings on December 7, 2007, in San Antonio, TX.
- Presented a poster on outcome data at the Alcohol Policy 14 conference in San Diego, CA, in January 2008.
- Presented cost study findings at the Addiction Health Services Research conference in Athens, GA, on October 16, 2007.
- Coded participant MI audio-taped sessions and provided feedback to therapists.
- Continued editing and cleaning on Phase I and Phase II data.

4. Reportable Outcomes

Preliminary outcome data have been presented at several conferences during 2007. We are still collecting baseline data and working to increase the follow-up rates. Presentations are included in Appendix A.

5. Conclusions

Preliminary data indicate that both the IMI and GMI produced better outcomes (i.e., lower number of drinks) at a short-term follow-up than the SAS currently offered to Air Force personnel. These findings are tempered by a low follow-up rate, and analyses will need to be done to ensure that those not completing follow-up assessments were no different from those who completed the study.

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Appendix A: Presentations and Poster



Motivational Interventions to Reduce Alcohol Use in a Military Population

Presented at

Community Behavioral Health Division Research Meeting

San Antonio, TX

June 6, 2007

Presented by

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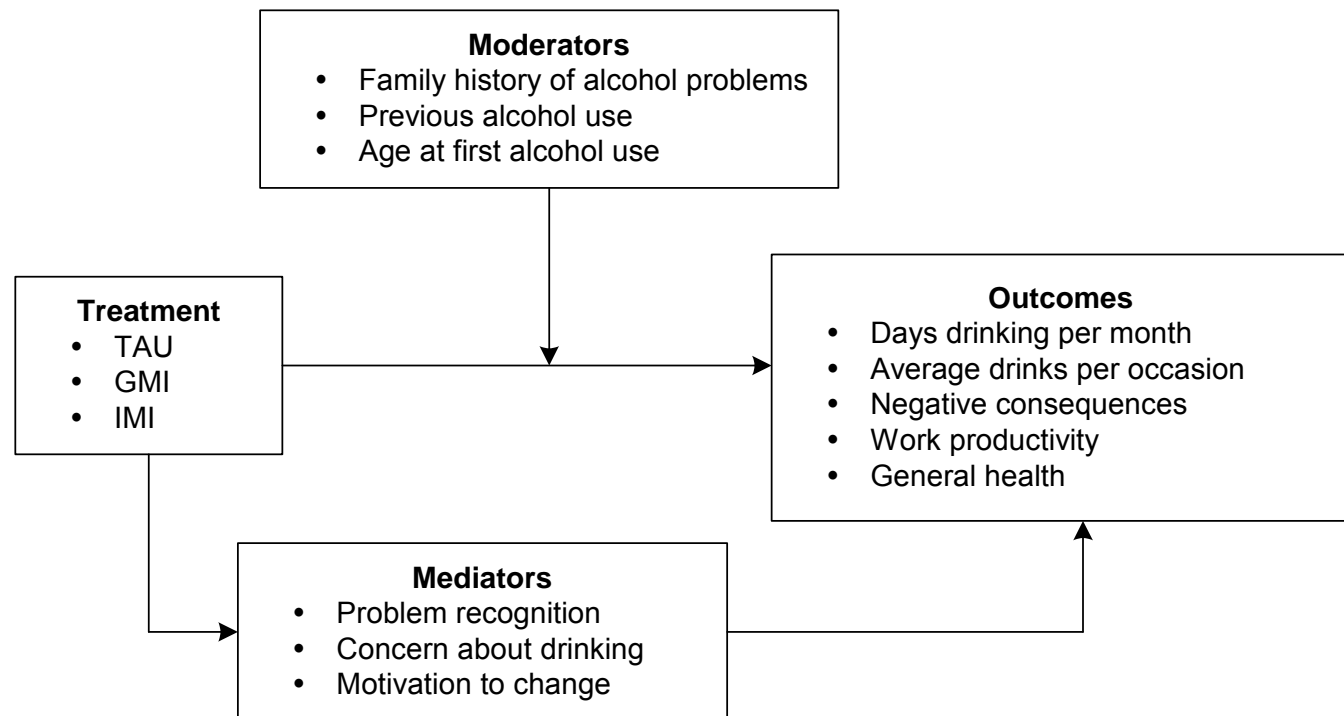
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Technical Objectives

- To evaluate the short-and long-term effectiveness of two motivational interventions with Air Force personnel who have been referred to ADAPT for screening.
- To compare group and individual motivational interventions with each other and with the Substance Abuse Seminar currently offered.
- To test mediators and moderators of the interventions' effects.
- To assess the cost and cost-effectiveness of the three interventions.

Model of Intervention Effects





Interventions

- Group Motivational Intervention (GMI)
 - Group format
 - Group dynamics
 - ◆ Group polarization
 - ◆ Production blocking
 - ◆ Social Loafing
 - Alcohol use, problems, solutions
 - 2 to 2.5-hour session
- Individual Motivational Intervention (IMI)
 - Individual format
 - Alcohol use, problems, solutions
 - .5 to 1-hour session
- Treatment As Usual (TAU)
 - Group format
 - Education and information
 - 6- to 8-hour session



Enrollment

- Eglin 52
 - IMI = 18
 - GMI = 12
 - TAU = 22
- Offutt 68
 - IMI = 22
 - GMI = 22
 - TAU = 24
- Lakenheath 18
 - IMI = 6
 - GMI = 5
 - TAU = 7



Demographic Data

	Characteristic	Percent
Gender	Male	86.8
	Female	13.2
Marital Status	Married	28.5
	Single	66.9
	Separated	4.0
	Family History (Alcohol)	27.8
	Age	25.5 (19-49)



Demographic Data (cont.)

	Characteristic	Percent
Education	GED or less	2.1
	H.S. Graduate	86.1
	Associate Degree	5.4
	Bachelor's Degree	6.4
Paygrade	E1 – E3	48.4
	E-4 – E7	47.4
	O1 – O3	4.2



Baseline Alcohol Use

Characteristic	Percent
Drinks per Week	
1 to 2	54.5
3 to 4	24.6
5 to 6	11.9
7 or More	9.0
Heavy Days during Past 30 Days*	
0	29.1
1 to 2	59.7
3 to 4	9.0
5 or More	2.2
Number of Drinking Days during Past 30 Days	
1 to 2	61.2
3 to 4	26.2
5 to 6	3.7
7 or More	2.9



Baseline Alcohol Use (cont.)

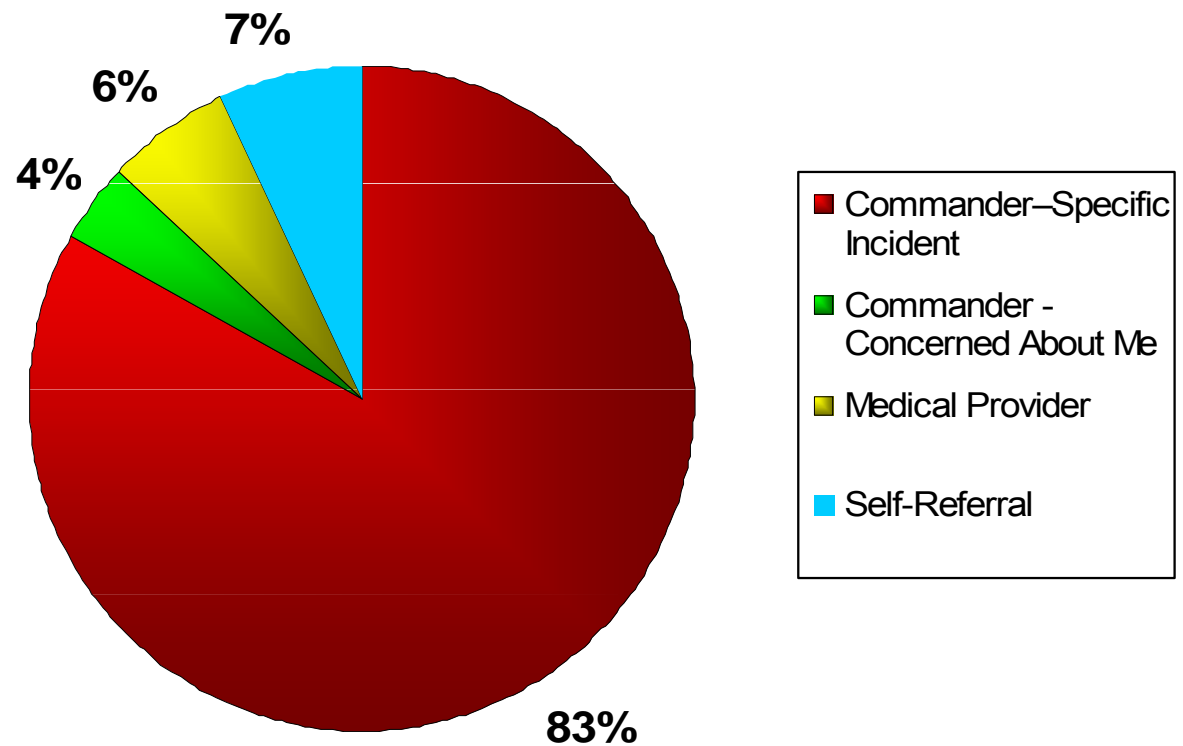
Characteristic	Percent
Number of Drinks per Drinking Day	
1 to 2	10.4
3 to 4	40.3
5 to 6	28.4
7 to 8	7.5
9 to 10	6.7
11 or More	6.7
Number of Drinks on Heaviest Drinking Day	
1 to 2	9.7
3 to 4	20.2
5 to 6	29.1
7 to 10	26.8
11 to 15	9.0
16 to 22	5.2



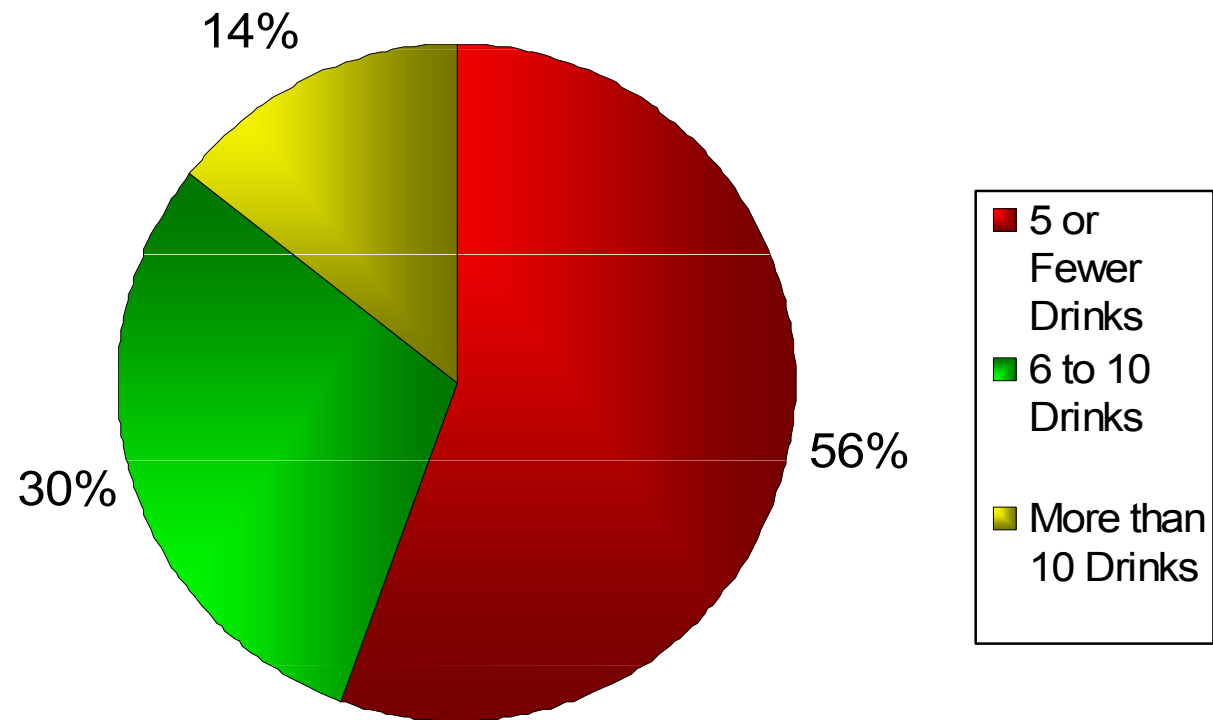
Alcohol Use: Culture and Productivity

Alcohol Use Culture	% Agree or Strongly Agree
It's hard to fit in in my command if you don't drink	5.3
Drinking is part of being in my unit	9.9
Drinking is part of being in the Military	19.2
Drinking is just about the only recreation available at this installation	6.7
At parties/social functions, everyone is encouraged to drink	12.6
At parties/social functions, nonalcoholic beverages are not always available	25.8

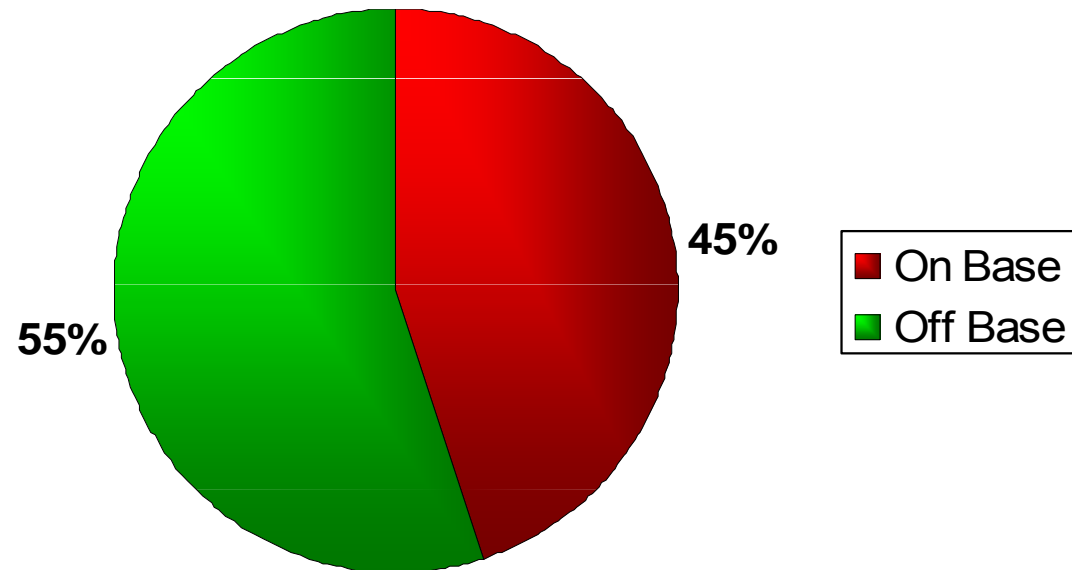
Reason for Referral



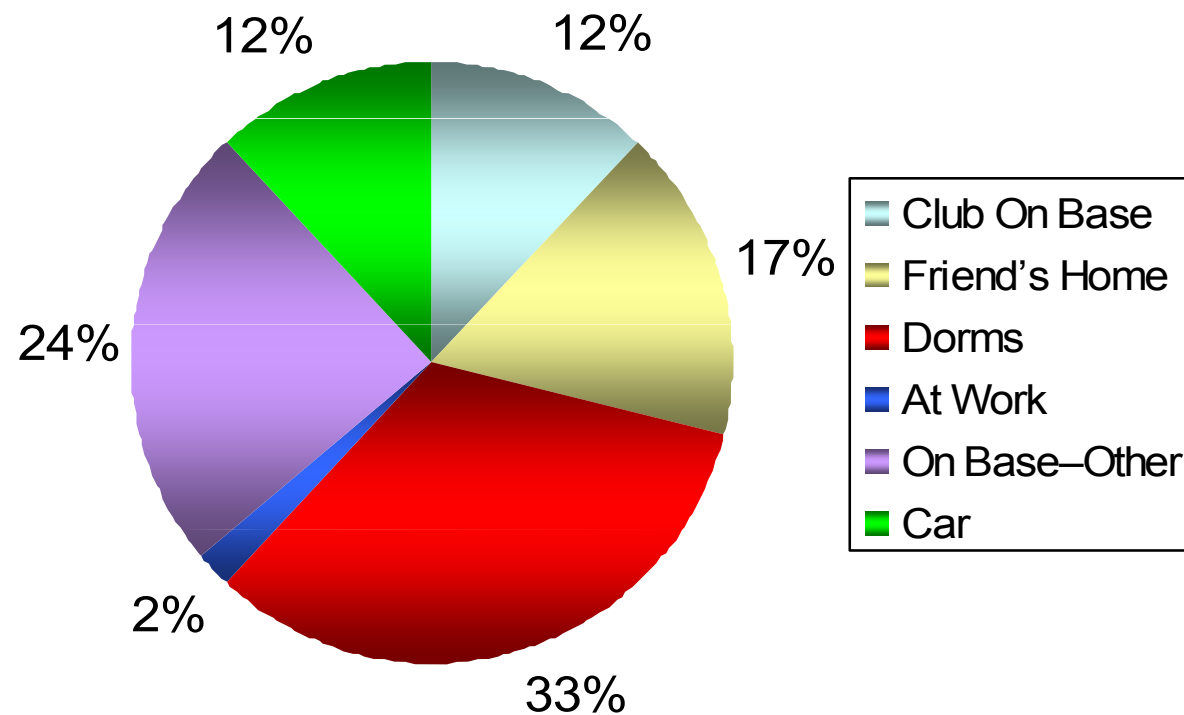
Referral Incident Alcohol Quantity



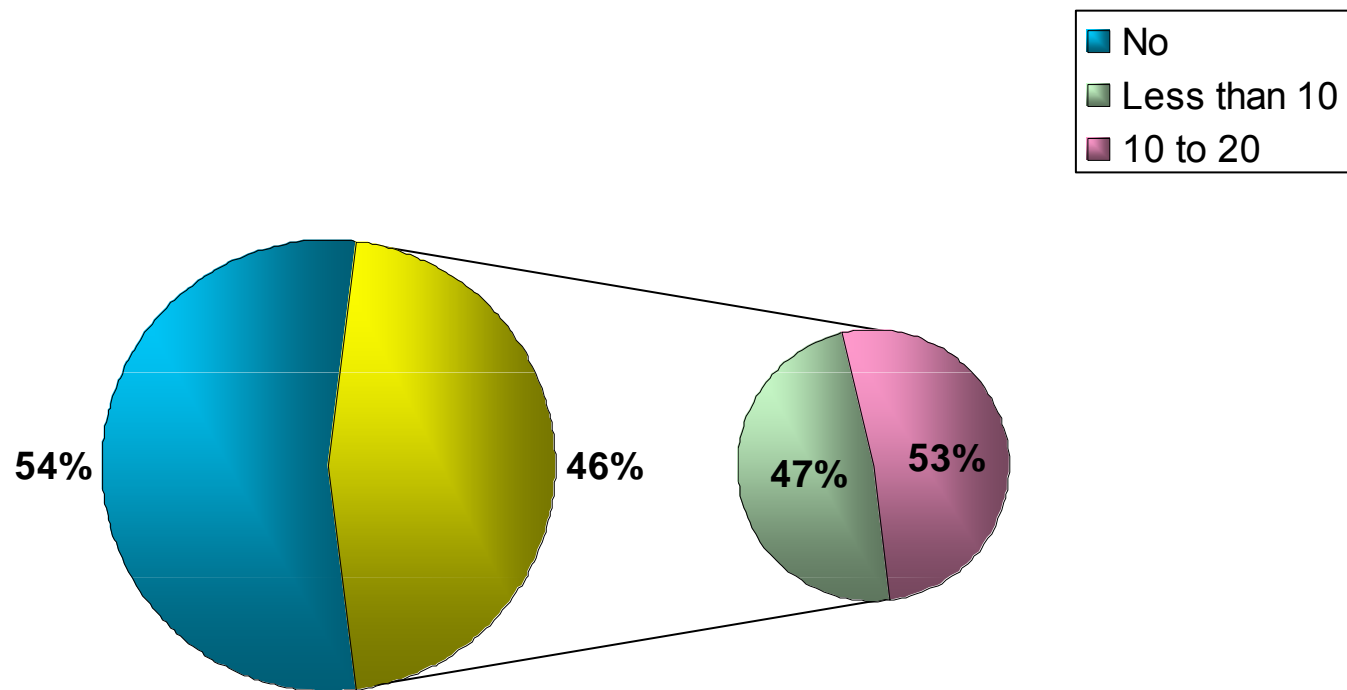
Referral Incident Location



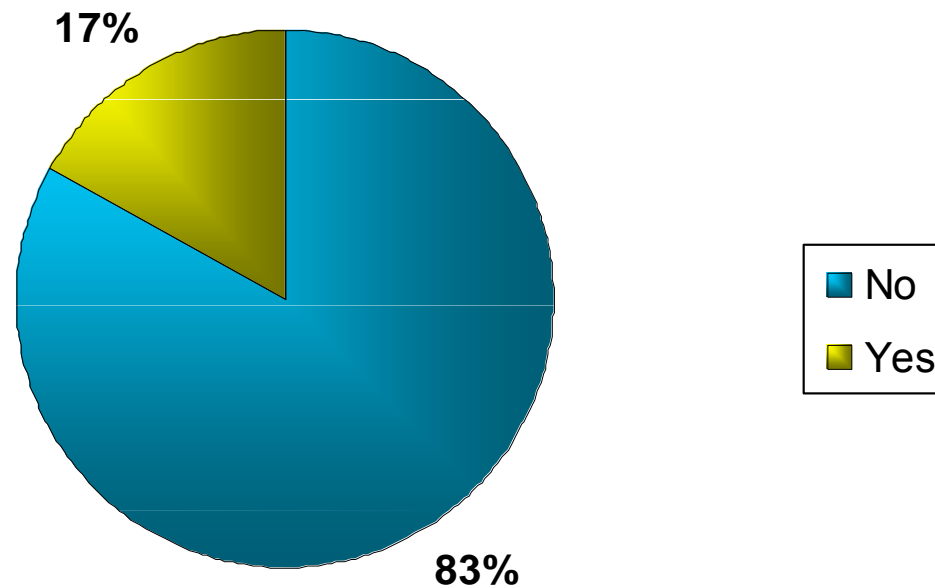
Referral Incident Specific On-Base Location



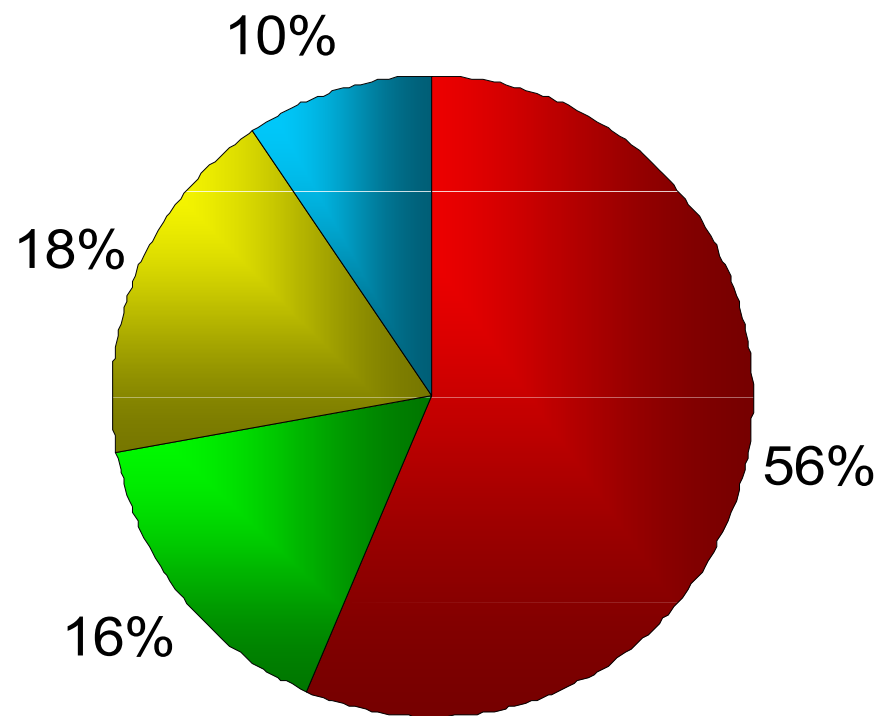
Cigarette Use



Smokeless Tobacco Use



Productivity Loss (Days)



0 Days

1 Day

2 to 3 Days

4 to 8 Days

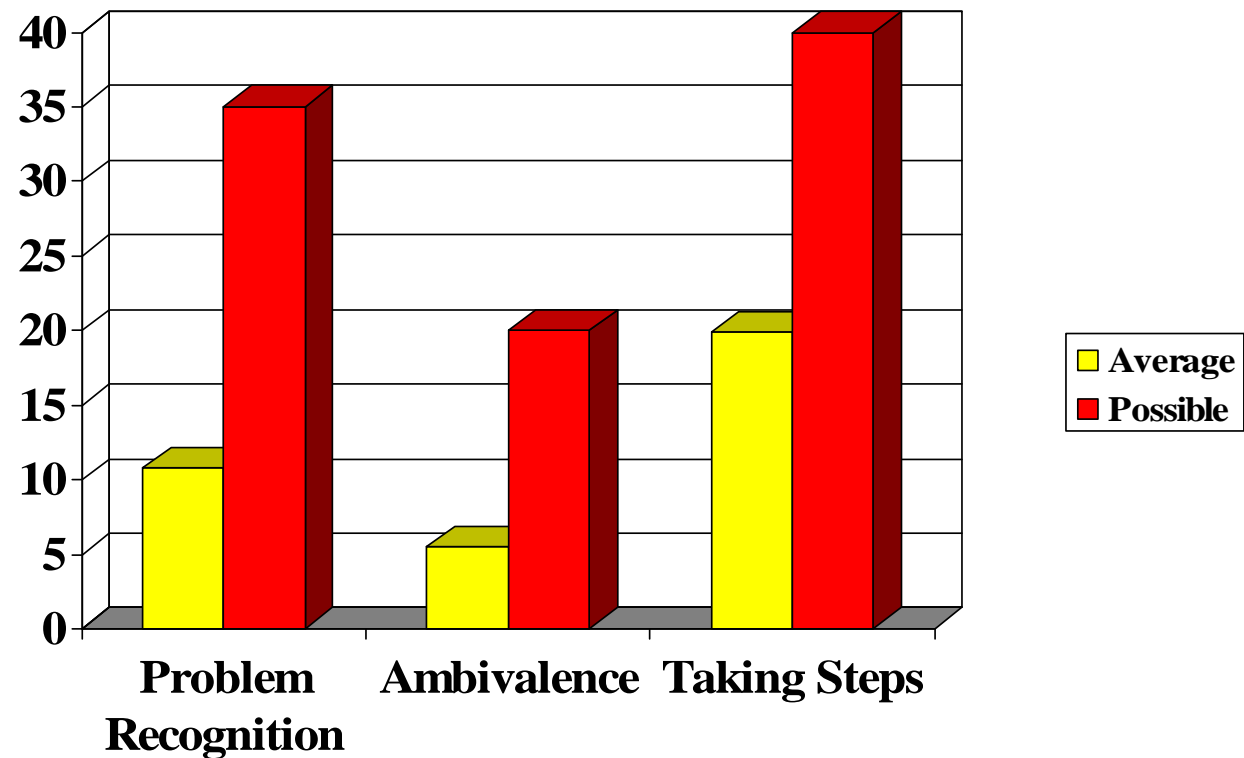


Desire to Change

Change

Importance of Change	6.2
Desire to Change	4.3
Confidence in Changing	9.4

Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES)





Perceived Norms

Reported the perception that more than 50% of permanent party personnel are engaging in behavior.

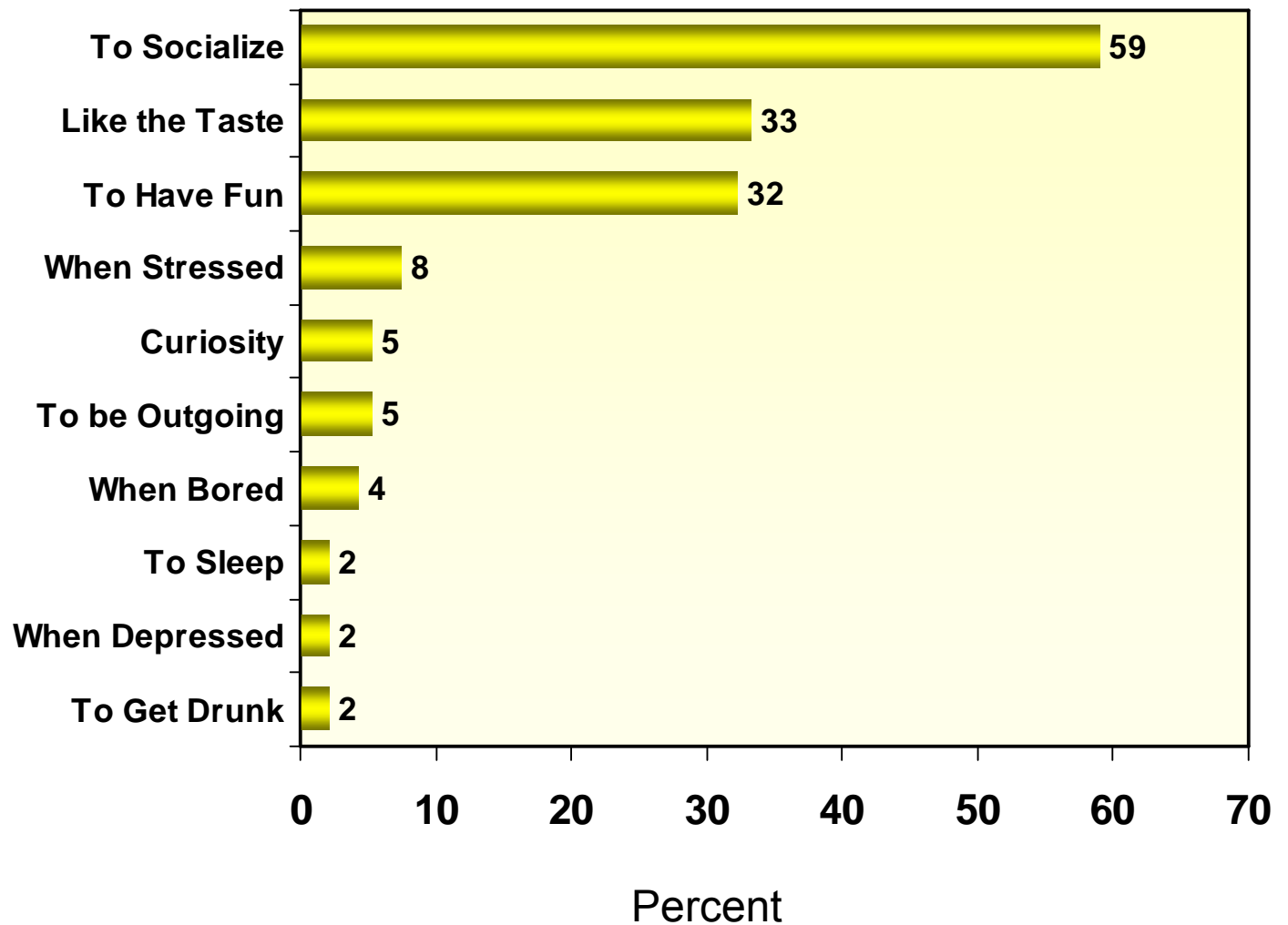
- | | |
|----------------------------|-----|
| ■ Drink regularly | 70% |
| ■ Get drunk on weekends | 38% |
| ■ Smoke cigarettes regular | 35% |
| ■ Use smokeless tobacco | 12% |



AUDIT

- Non-Problem Drinking 46.1%
 - AUDIT score <8
- Hazardous Drinking 49.4%
 - AUDIT score 8-15
- Harmful Drinking 3.4%
 - AUDIT score 16-19
- Possible Dependence 1.1%
 - AUDIT Score ≥ 20

Reasons for Drinking

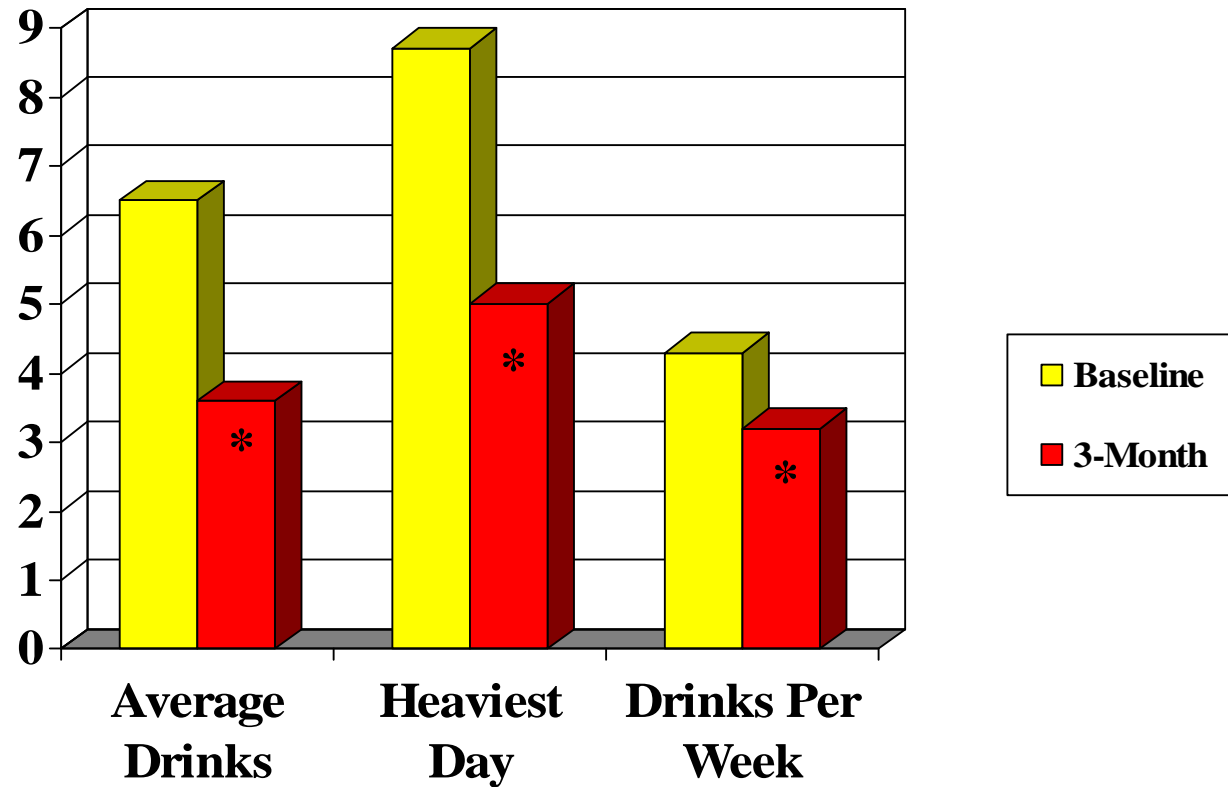




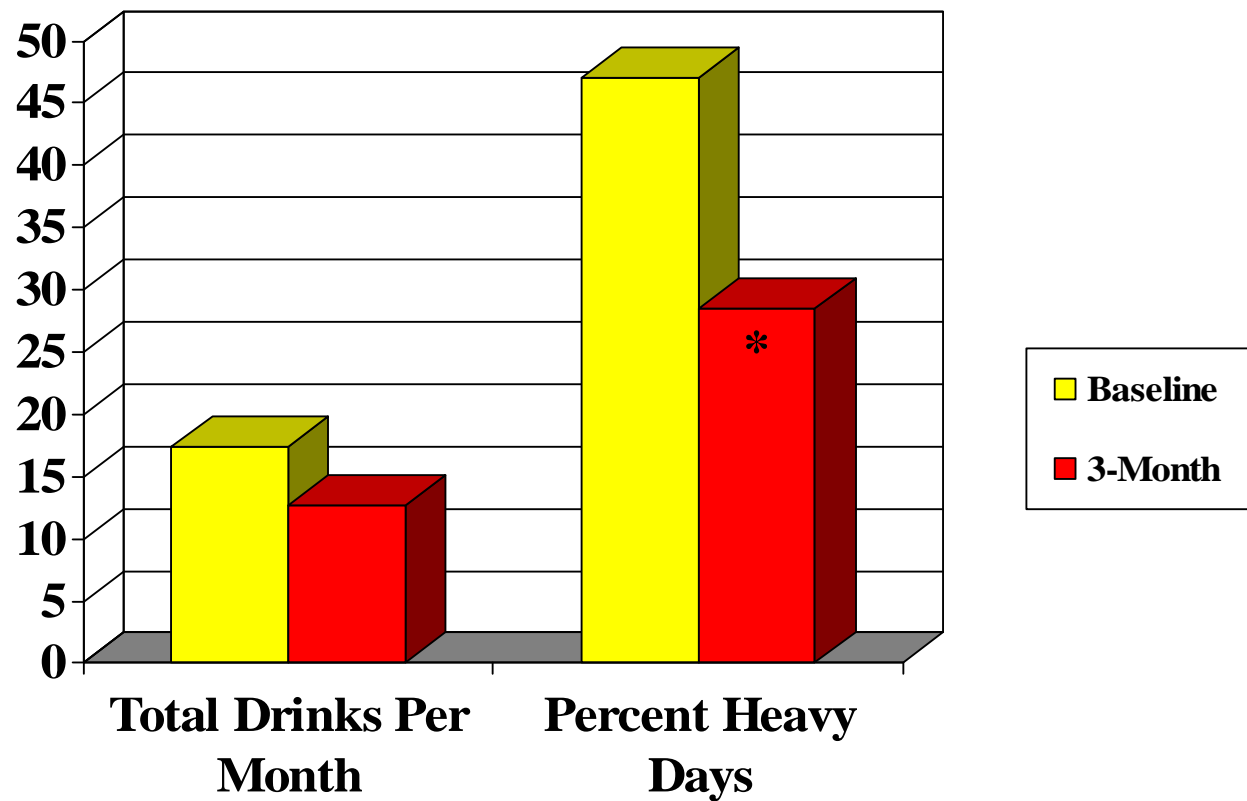
Follow-up Rates by Condition

	Baseline	Follow-up	
IMI	46	18/40	45%
TAU	53	14/41	34%
GMI	39	15/32	47%
OVERALL	138	47/113	42%

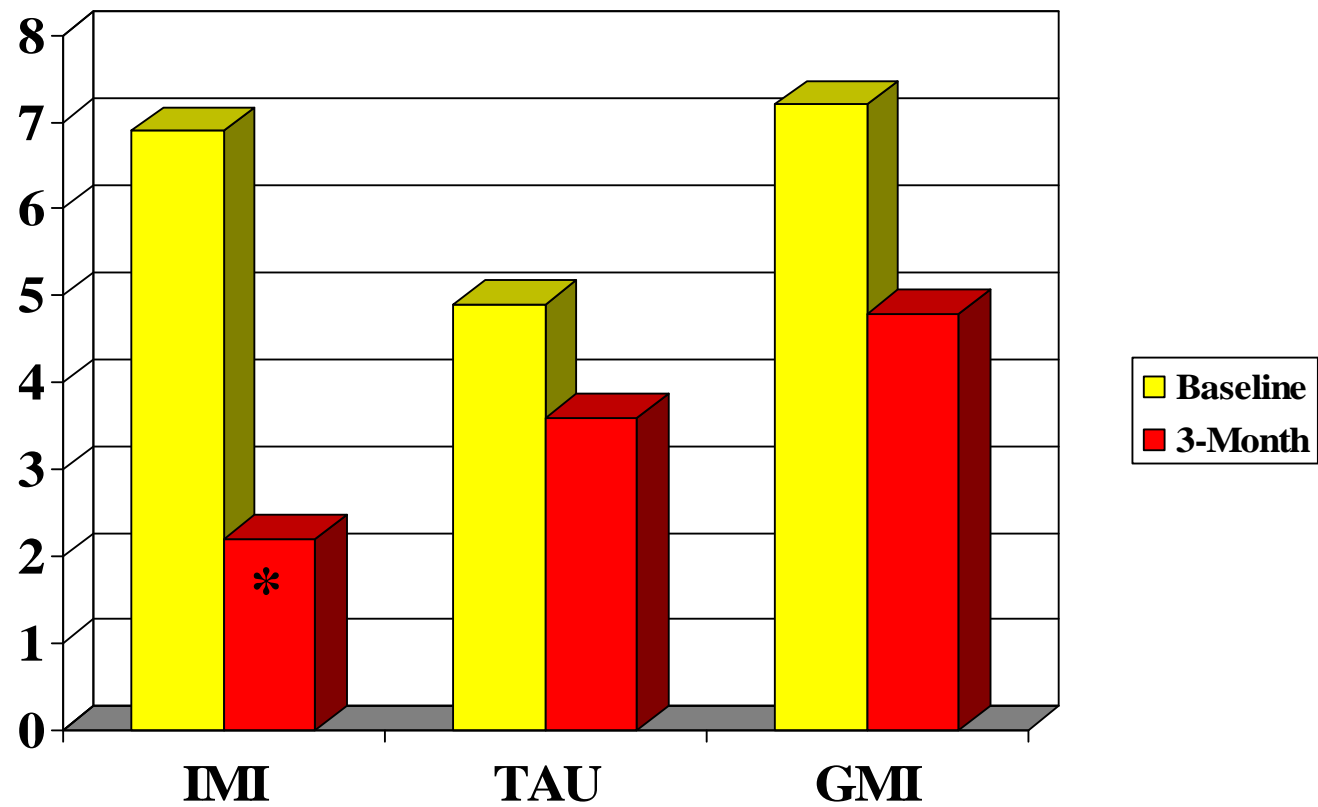
Alcohol Outcomes – Full Sample



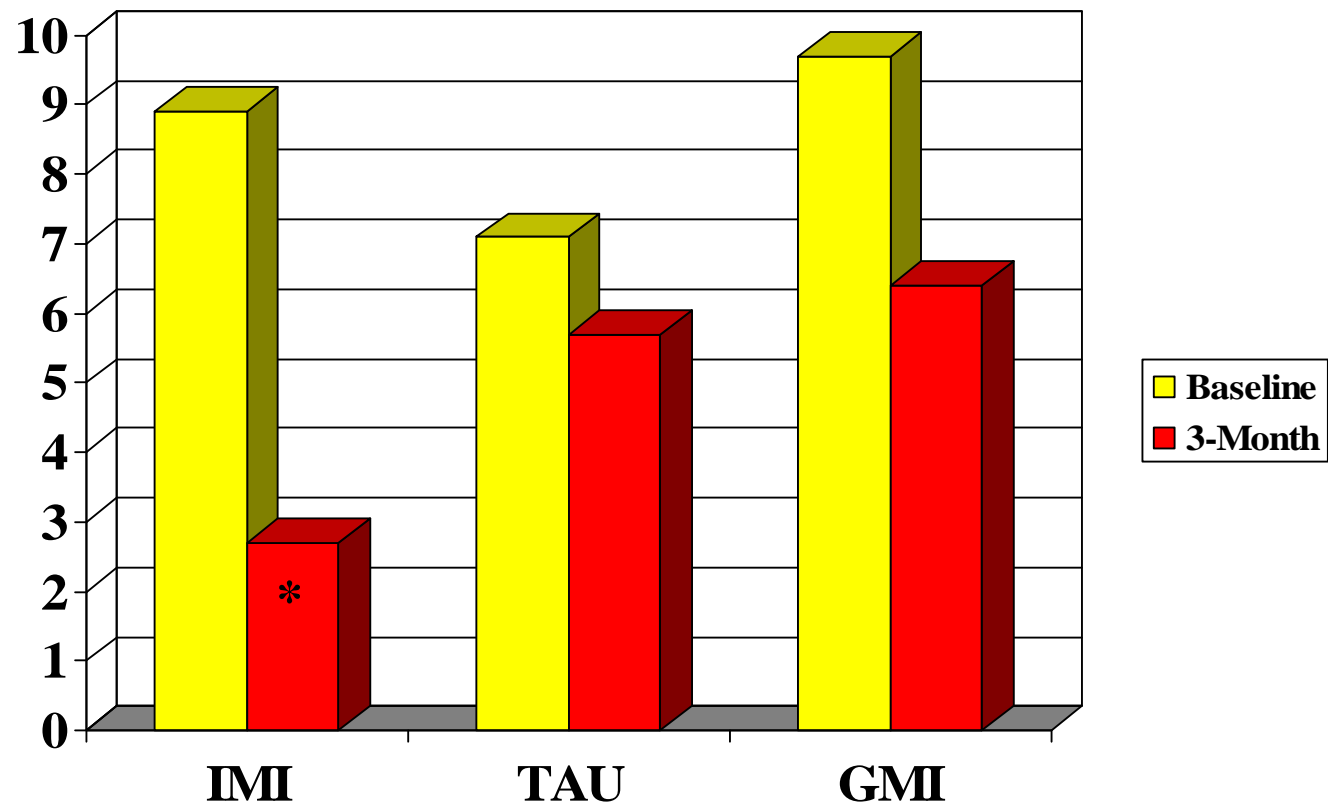
Alcohol Outcomes – Full Sample



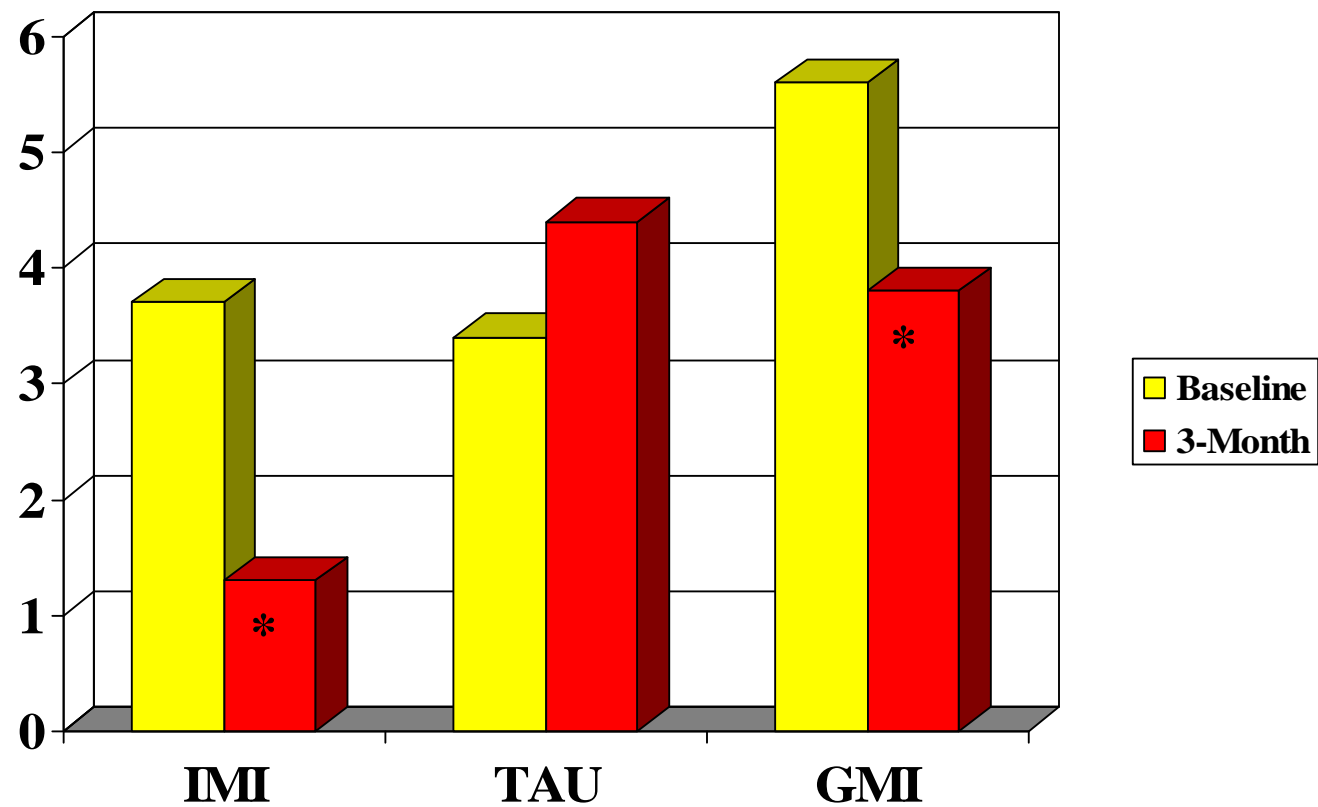
Average Drinks Per Drinking Day



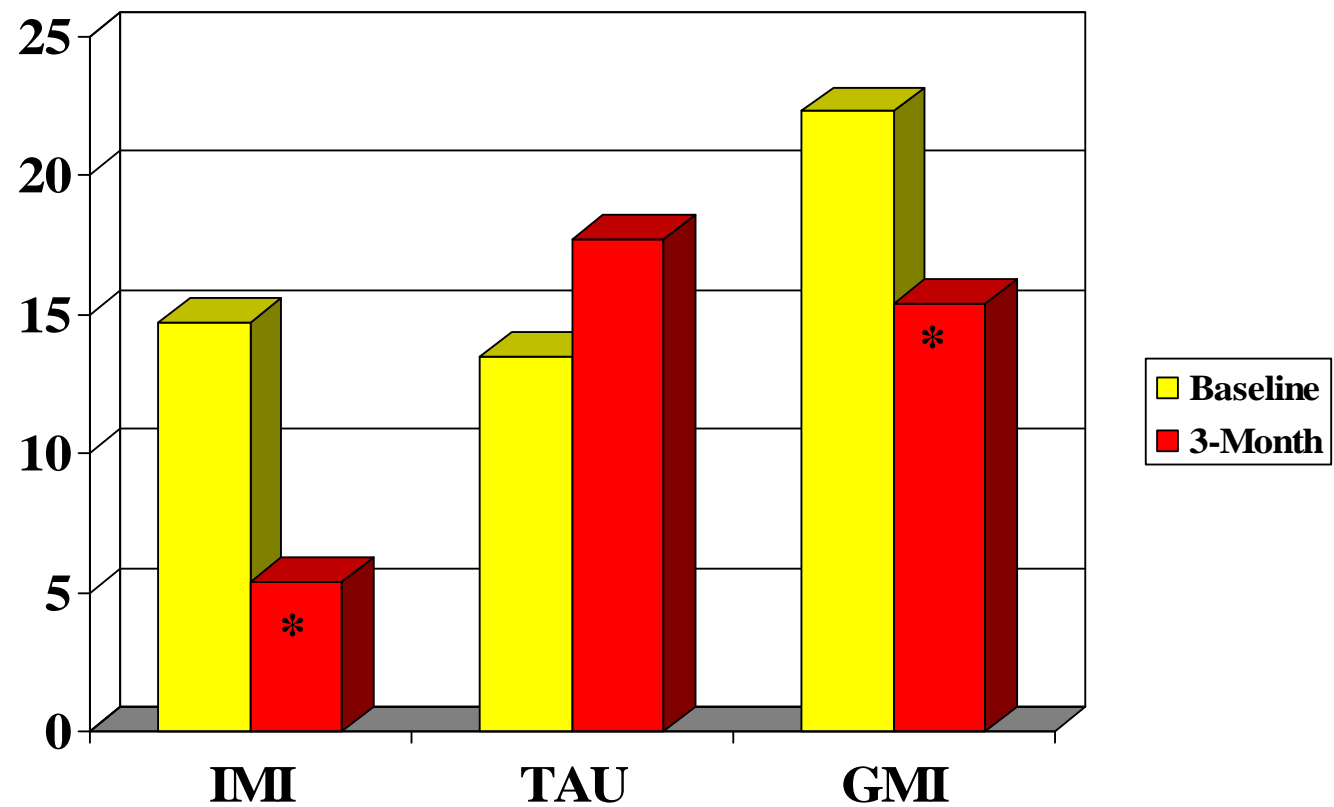
Maximum Drinks On Drinking Day



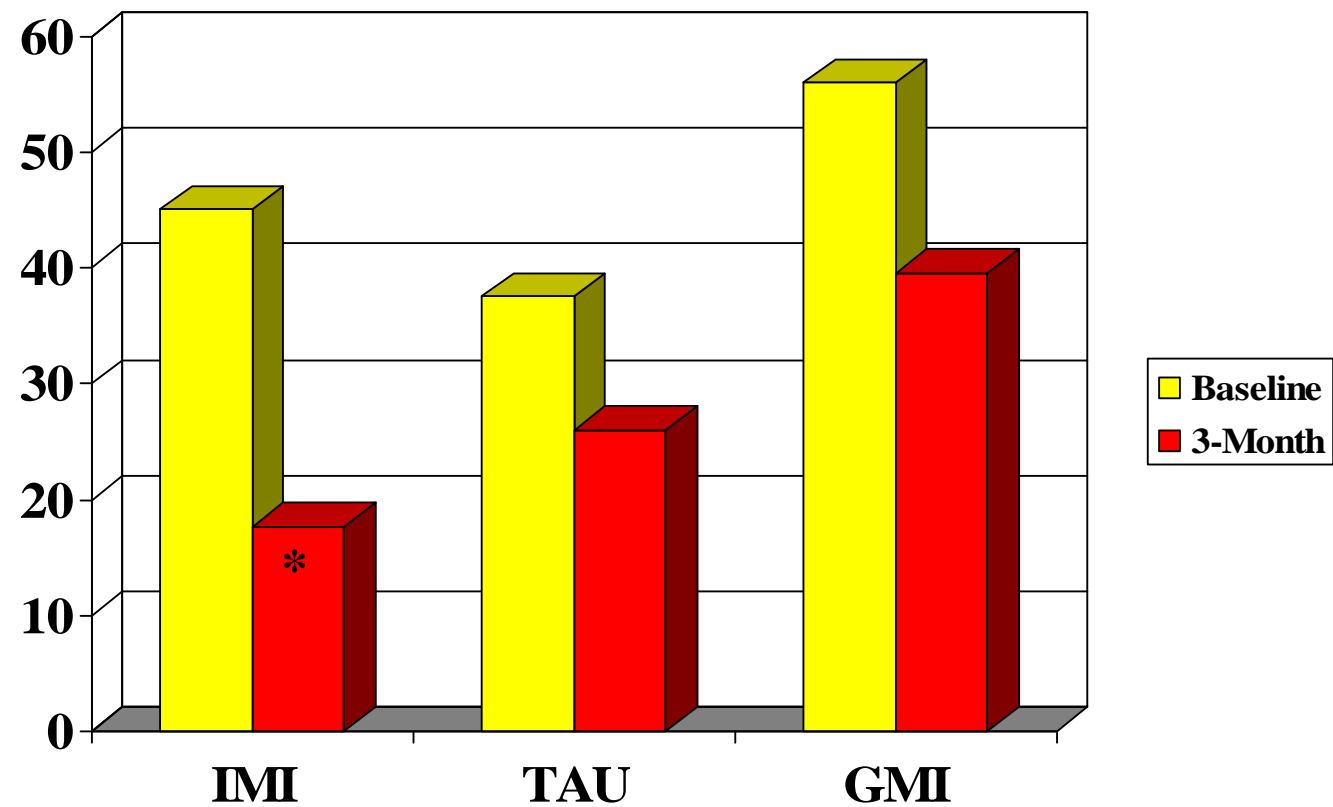
Average Drinks Per Week



Total Drinks Per Month



Percent Heavy Drinking Days





Challenges

- SUAT – challenges with getting data
- Low follow-up rate
 - combine 3, 6, and 12?
 - 12 participants with 6 month FU as their 1st follow-up
 - no “new” 12 month FUs
- ADAPT staff turnover
- Slow recruitment



Plans for Next Six Months

- Add new installations:
 - Sheppard AFB - July, 2007
 - Travis AFB – May join the study (TBD)
- MI Booster Training
 - Eglin AFB - June 27, 2007
 - Offutt AFB – Date TBD
- Continue to work on improving follow-up rates
- Continue to clean, edit, and analyze data

turning knowledge into practice

Motivational Interventions to Reduce Alcohol Use in a Military Population: Cost and Effectiveness

Alexander J. Cowell, Ph.D.

October 16, 2007



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- Yuta Masuda
- Funding from DOD # W81XWH-04-1-0072

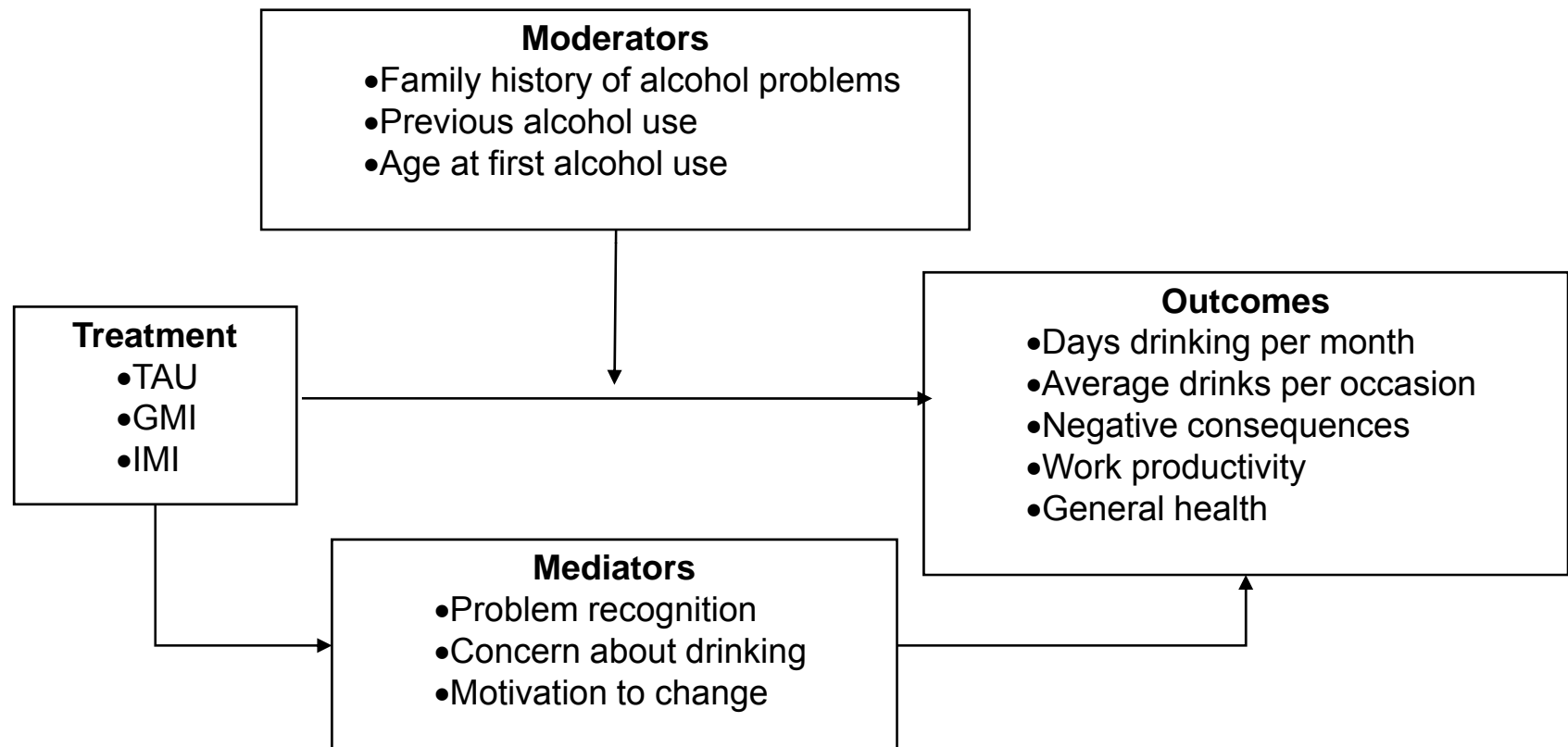
Structure of Presentation

- Background
 - Cost Study Objectives
 - Approach
- Preliminary Results
- Conclusions



Introduction

Model of Intervention Effects



Interventions

- **Treatment as Usual (TAU)**
 - Standard treatment for Air Force personnel involving a full day of alcohol education and information sessions
 - 6-10 hour session
- **Group Motivational Interview (GMI)**
 - Participants receive a brief motivational interview session in a group setting
 - 2-2.5 hour session
- **Individual Motivational Interview (IMI)**
 - Participants receive a one-on-one brief motivational interview session
 - .5-1 hour session

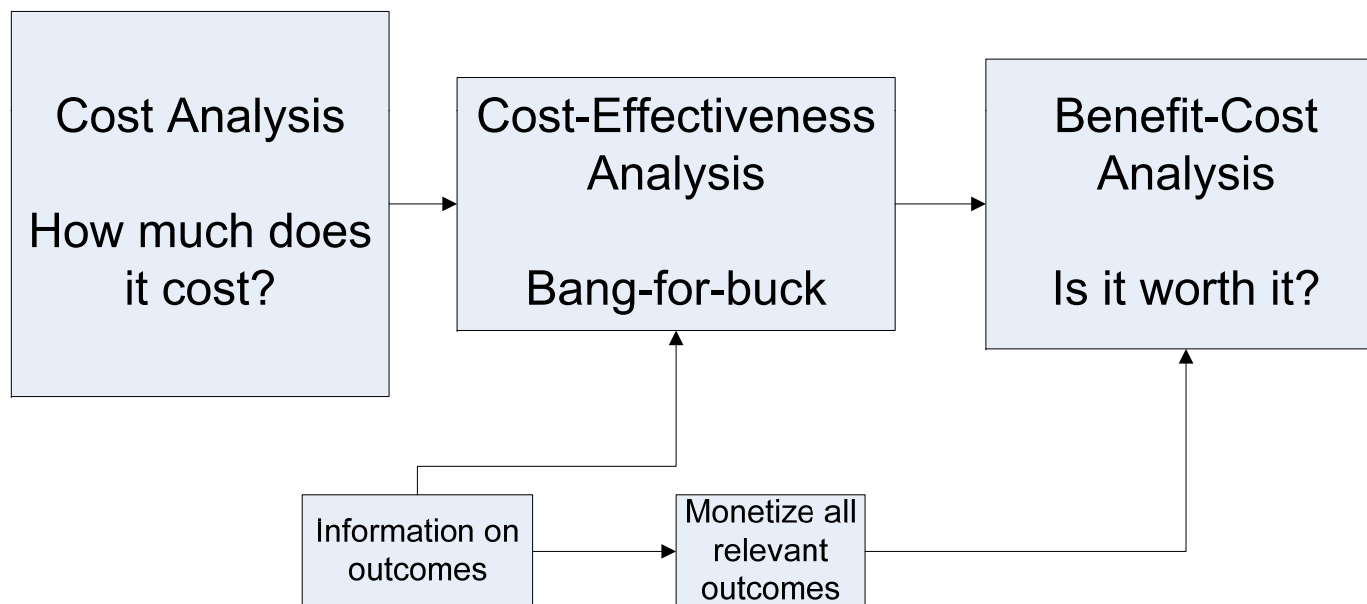
Technical Objectives

- To examine the costs for three variants motivational interviewing (MI): Treatment As Usual (TAU), Group MI (GMI), and Individual MI (IMI)
- To examine the cost-effectiveness of TAU, GMI, and IMI

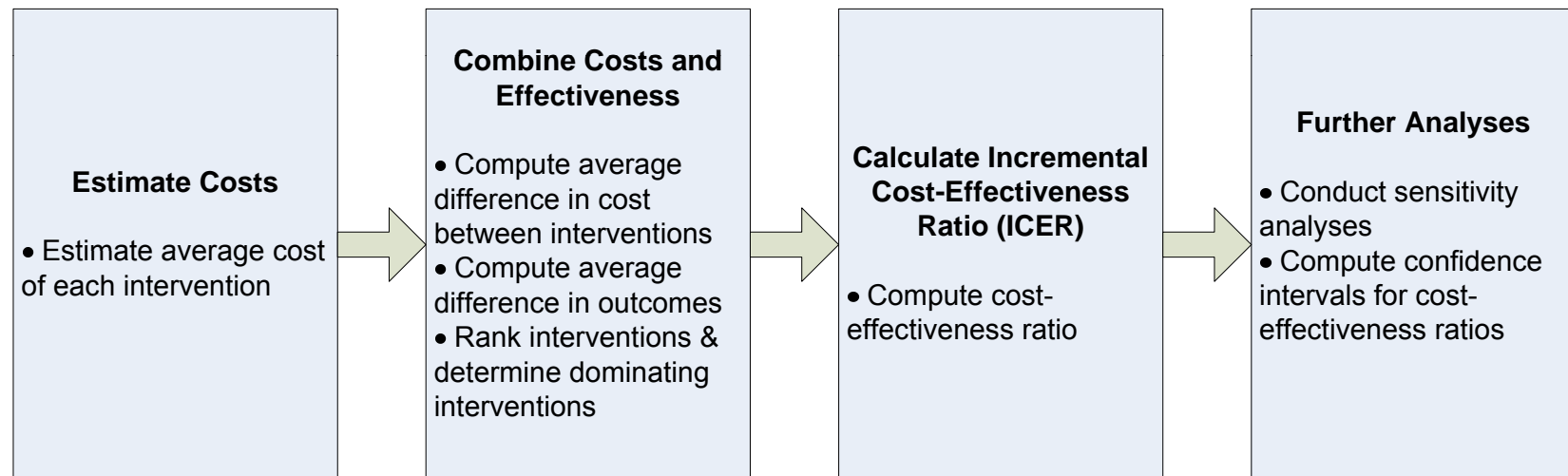


Methods

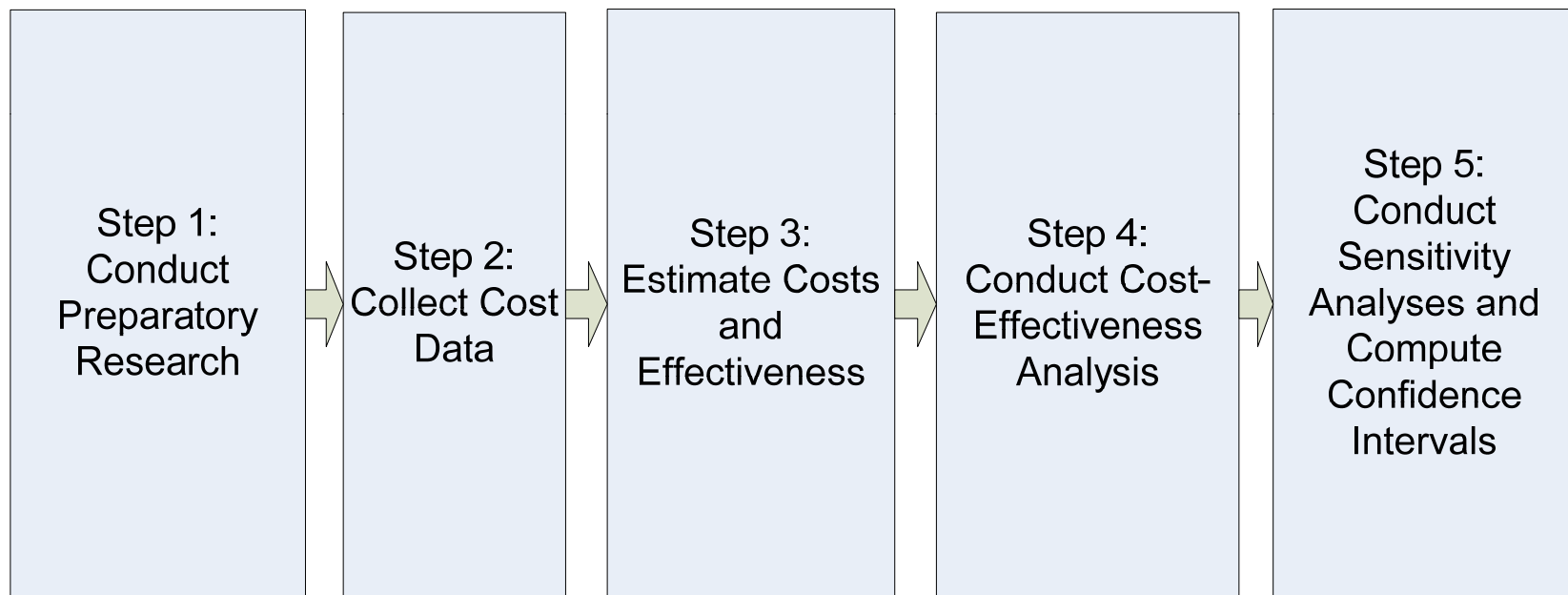
Methods: Types of Cost Analyses



Methods: Logic Model of Cost-Effectiveness Analysis



Methods: The Five Steps of Cost-Effectiveness Analysis



Methods: Sample

- Setting: 4 Air Force Bases (3 currently active)
- Target Population: heavy drinkers among military personnel
- Target n = 675
 - 225 for each intervention arm
- Data collection started in 01/2006 and is ongoing

Methods: Enrollment

- Eglin AFB = 77
 - TAU = 34
 - GMI = 19
 - IMI = 24
- Offutt AFB = 74
 - TAU = 26
 - GMI = 24
 - IMI = 24
- Lakenhealth AFB = 20
 - TAU = 8
 - GMI = 5
 - IMI = 7
- Sheppard AFB = 24
 - TAU = 9
 - GMI = 5
 - IMI = 10

*As of October 2, 2007

*Includes those who are now inactive

Methods: Enrollment cont.

Intervention Arm	Enrolled N (used here)	**FU-rate
TAU	53	14/41 (34%)
GMI	39	15/32 (47%)
IMI	46	18/40 (45%)
Total	138	47/113 (42%)

*As of October 2, 2007

**As of May 1, 2007

Methods: Data Collection

- Cost Data
 - Specifically designed quarterly instrument
 - Training hours
 - Time spent on each intervention
 - Space (in square feet) of intervention room
- Outcome data
 - Self administered web surveys
 - Baseline, 3, 6, and 12 months

Methods: Cost Effectiveness

- What is Cost-effectiveness?
 - Results describe trade-off between an improvement in the outcome and the cost required to achieve it, or
 - How much does it cost to achieve a 1 unit improvement in the outcome, or
 - “bang for buck” (really “buck per bang”)

Methods: Incremental Cost-Effectiveness Ratio (ICER)

- Rank order interventions from lowest to highest cost per intervention
- Eliminate dominated interventions from further consideration
- Compute incremental cost-effectiveness ratios (ICERs)

$$ICER = \frac{\Delta C}{\Delta E} = \frac{(Average Cost_j - Average Cost_k)}{(Average Outcome_j - Average Outcome_k)}$$

Methods: Estimating Cost

$$\text{Cost per Intervention} = \sum_{j=1}^{\wedge} \text{Cost per Unit}_j \times \text{Number of Units}_j = \sum_{j=1}^{\wedge} p_j q_j$$

- For each session
 - Labor - time staff spent conducting session
 - Space - cost of space used during session

Preliminary Results

- 4 Quarters of Data
- Assumptions
 - Wages are not fully loaded
 - For space cost used Offutt AFB's space costs for all bases
 - Imputed time for training costs for missing data



Preliminary Results

Training Times

Base	Mean Training Time (in hours)	Mean Cost by Trainee Salary	Mean Total Cost
Eglin	46.4	\$1,102.60	\$1,336.68
**Sheppard	27.9	**\$657.44	**\$710.50
**Offutt	**31.6	**\$738.06	**\$750.06
Lakenheath	26.5	\$704.88	1,000.91
Total Per Trainee	33.1	\$817.50	\$980.92

*In 2007 dollars

**Imputed data

Average Cost Per Session

- Including salary and space cost
- Per session across all three bases

Intervention	Cost
TAU	\$213.30
GMI	\$70.34
IMI	\$46.19

Average Intervention Cost Per Participant By Base

- Including salary and space cost
- Per participant by base

Intervention	Eglin	L'heath	Offutt
TAU	\$13.91	\$21.69	\$27.54
GMI	\$25.89	\$6.03	\$16.44
IMI	\$37.96	\$47.71	\$47.92

ICER

		Number of Heavy Drinking Days		Total Drinking Days		Maximum Number of Drinks	
Treatment Arm	Mean Cost (\$)	Mean Effectiveness	ICER ($\Delta C/\Delta E$, \$)	Mean Effectiveness	ICER ($\Delta C/\Delta E$, \$)	Mean Effectiveness	ICER ($\Delta C/\Delta E$, \$)
GMI	19.78	1.31	-	2.31	-	6.37	-
TAU	29.91	1.55	Dominated (strict)	3.27	Dominated (strict)	5.55	Dominated (extended)
IMI	43.58	0.86	-52.88	2.14	-139.98	3	-7.06

ICER cont.

		Number of drinks per week		Mean drinks on a drinking day		Percentage of days of heavy drinking	
Treatment Arm	Mean Cost (\$)	Mean Effectiveness	ICER ($\Delta C/\Delta E$, \$)	Mean Effectiveness	ICER ($\Delta C/\Delta E$, \$)	Mean Effectiveness	ICER ($\Delta C/\Delta E$, \$)
GMI	19.78	3.84	-	4.77	-	39.62	-
TAU	29.91	3.95	Dominated (strict)	3.7	Dominated (extended)	32.11	Dominated (extended)
IMI	43.58	2.55	-18.44	2.25	-9.44	19.12	-1.16

ICER cont.

		Total number of drinks per month	
Treatment Arm	Mean Cost (\$)	Mean Effectiveness	ICER ($\Delta C/\Delta E$, \$)
GMI	19.78	15.37	-
TAU	29.91	15.82	Dominated (strict)
IMI	43.58	10.21	-4.61

Next Steps

- Loading salary costs
 - In Air Force, benefits include
 - Food
 - Housing
 - Cost of living allowances (COLAs) if overseas
- Include uncertainty
- Move to a cost-benefit analysis
 - Have value of participant time
 - Full cost of participating in intervention
 - Value of any reduced absenteeism
 - Value or cost of health care

Discussion and Conclusion

- Preliminary results suggest that TAU is dominated, regardless of the drinking outcome
- Using individual rather than group MI intervention,
 - a 1 percent reduction in days of heavy drinking → \$1 per participant
- Complete data collection and cost-benefit yet to come

Group and Individual Motivational Interventions with Air Force Personnel

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RTI International is a trade name of Research Triangle Institute.

1. Introduction

Alcohol use continues to be a concern in military populations. Despite decreases in the prevalence of use of most legal and illegal drugs, consumption and abuse of alcohol remain at high levels. Approximately 70% of military personnel are current drinkers, and 20% of those are heavy episodic drinkers, defined as consuming five or more drinks on a single occasion at least once a week. Problem drinking is associated with a host of interpersonal, social, and health-related problems and can affect the military readiness of troops. Recently developed strategies to reduce heavy drinking involve the use of brief, motivational interventions that include a detailed assessment of alcohol use behavior.

In 1998, an estimated one in five military personnel were heavy alcohol users. In 2003, it was estimated that the Department of Defense (DoD) spends more than \$600 million each year on health care costs related to alcohol abuse, and an additional \$132 million to care for babies with fetal alcohol syndrome. Because alcohol dependence and problematic drinking can be expensive to treat and can result in serious health consequences including liver damage, impaired immune and endocrine system function, cardiomyopathies, polyneuropathies, psychosis, and can result in unintended consequences such as high-risk sex, occupational injury, drunk driving, domestic violence, and other negative social and/or health outcomes, the DoD would benefit from studies illustrating the performance of different alcohol interventions, as well as the cost-effectiveness of those interventions.

There is scant evidence regarding the effectiveness of specific alcohol use interventions in military populations, including motivational interviewing (MI). This study will empirically assess the effectiveness of two MI-based interventions compared with the Air Force's Substance Abuse Seminar (SAS). Findings from this study will provide information regarding potential interventions for use by the DoD as part of its alcohol abuse reduction initiative. Specifically, the data will help inform alcohol abuse prevention strategies targeted toward heavy-drinking personnel. Our findings will also have important implications for the DoD's efforts to develop comprehensive plans for treating alcohol abuse among military personnel. Finally, our results will help identify avenues for further research.

2. Method

The purpose of the study is to test the effectiveness of two brief intervention strategies for reducing heavy episodic drinking and negative consequences among military personnel. Individuals who were referred to a participating Air Force installation's ADAPT (Alcohol and Drug Abuse Prevention and Treatment program) for assessment were randomly assigned to one of three intervention conditions.

■ **Individual Motivational Interviewing (IMI) Condition:** Key elements of the IMI approach are (1) using an empathic therapist style, (2) helping participants perceive a discrepancy between their goals and their drinking, (3) eliciting self-motivational statements from participants, and (4) discussing alternatives for helping to change drinking behavior.

■ **Group Motivational Interviewing (GMI) Condition:** A group MI condition has been included to test whether MI delivered in a group setting is more effective than standard treatment (which also consists of a group intervention). While the elements of the GMI approach are the same as those for the IMI approach, individuals assigned to this condition will be seen in groups of five to six. Each session will last approximately 2 hours.

■ **Substance Abuse Seminar (SAS) Condition:** Individuals randomized to the SAS group will receive the education established by Air Force Instruction (AFI) 44-121, Section 3.14, which states: "All patients referred for substance abuse assessment who do not meet diagnostic criteria for alcohol abuse or alcohol dependence will be provided a minimum of 6 hours of awareness education. Substance abuse awareness education incorporates information on individual responsibility, Air Force standards, legal and administrative consequences of abuse, decision making, dynamics of substance abuse, biopsychosocial model of addictions, values clarification, impact of substance abuse on self and others, family dynamics, and goal setting."

This research was supported by Grant No. W81XWH-04-1-0072 from the U.S. Department of Defense, U.S. Army Medical Research and Materiel Command.

The views expressed are those of the authors and do not reflect the official policies or positions of the Department of Defense or the United States Government.

3. Characteristics of the Sample

Table 1. Participant Characteristics

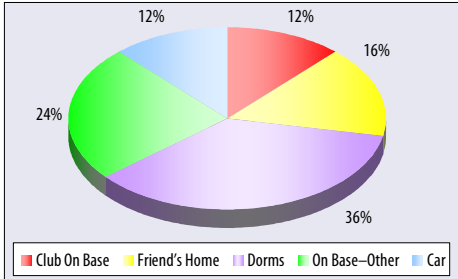
Characteristic	IMI	GMI	SAS	Total
Gender				
Male	78.8	95.0	81.0	83.8
Female	21.2	5.0	19.0	16.2
Marital Status				
Married*	36.4	40.0	19.1	32.5
Divorced	6.1	15.0	9.5	9.5
Single	48.5	45.0	66.7	52.7
Separated	9.1	0.0	4.8	5.4
Family history (alcohol)	46.2	35.7	46.7	43.6
Age (Mean)	27.3	7.5	25.5	26.3
Education				
GED or less	4.0	0.0	7.7	3.9
HS Diploma	88.0	76.9	92.3	86.3
Associate's Degree	4.0	15.4	0.0	5.9
Bachelor's Degree	4.0	7.7	0.0	3.9
Pay Grade				
E1–E3	48.0	30.8	60.0	47.2
E4–E7	48.0	61.5	40.0	49.1
O1–O3	4.0	7.7	0.0	3.8

*Includes 1 respondent living as married

Table 2. Alcohol Use Culture

	% Agree or Strongly Agree
It's hard to fit in if you don't drink	5.0
Drinking is part of being in my unit	7.1
Drinking is part of being in the Military	17.1
Drinking is the only recreation available	6.7
At social functions everyone is encouraged to drink	10.1
Non-alcoholic beverages are not always available	15.0

Figure 1. Referral Incident Specific Location On Base



3. Results

Figure 2. Number of Drinking Days — Past Month

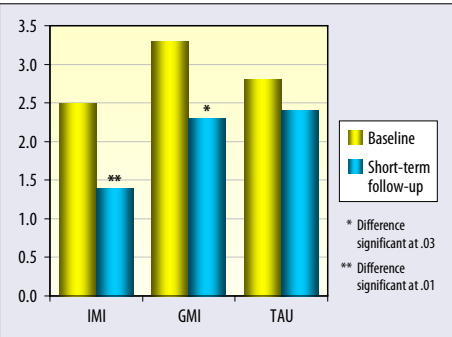


Figure 3. Average Number of Drinks — Past Month

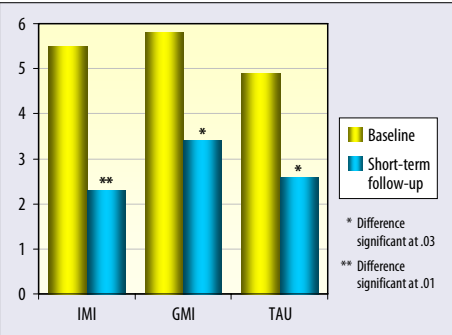
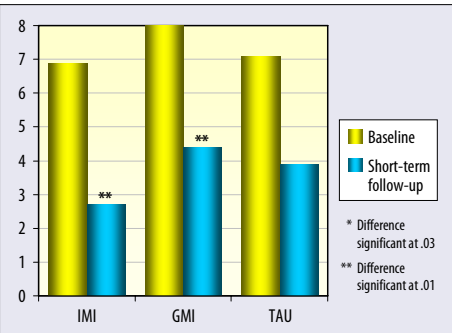


Figure 4. Largest Number of Drinks — Past Month



3. Results

Figure 5. Percent Heavy Drinking Days — Past Month

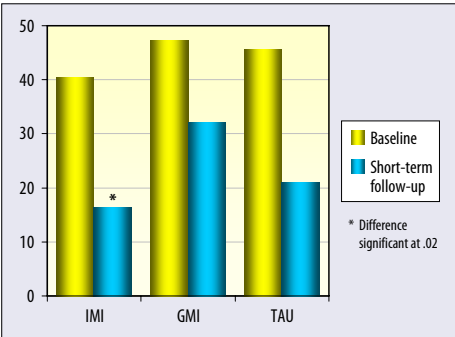


Table 3. Initial Models — Results

Measure	Estimate	DF	Significance Level
5+ drinks per drinking day			
Married/living as married*	-0.99	175	0.01
Any family history of alcohol problems*†	0.78	135	0.04
5+ drinking days in past month			
Married/living as married*‡	1.93	135	0.00
3+ binge days in past month			
Any family history of alcohol problems*‡	2.51	135	0.02

* Controlling for Gender

† Controlling for Marital Status

‡ Controlling for Family History of Alcohol Problems

- Both IMI and GMI resulted in significant decreases in the number of drinking days in the past month.
- Only the IMI condition produced a significant decrease in the percentage of binge drinking days.
- All three intervention conditions produced significant reductions in the average number of drinks per drinking occasion and in the total number of drinks during the heaviest drinking occasion.
- Those married/living as married were less likely than those never married to report heavy drinking.
- Those married or living as married more likely to report drinking on 5 or more days in past month
- Participants who reported having a blood relative with an alcohol problem more likely to report heavy drinking and binge drinking.

4. Conclusions

Current military alcohol abuse prevention programs aim to prevent the misuse of alcohol, eliminate the illegal use of alcohol by underage drinkers, provide counseling or rehabilitation to alcohol abusers, and provide education to various target audiences about the risks associated with alcohol use. Although these efforts have been ongoing and a number of studies have reported on the consequences of alcohol use in the military no published studies were found that examined the effectiveness of alcohol misuse prevention and treatment programs in the military.

Results of this research indicated that all three interventions resulted in decreased alcohol use. The two MI conditions produced more positive outcomes than treatment as usual with respect to the number of drinking days and the percentage of heavy, or binge drinking days. Significant decreases were found across all conditions for the average number of drinks consumed per drinking occasion and while not statistically significant, for the number of drinks consumed during the heaviest drinking occasion. The results are particularly exciting as this is one of the first true tests of a group motivational intervention and we were able to demonstrate that it is possible not only to do MI in a group format, but to produce results similar to those found with individual MI.

We also examined risk and protective factors for alcohol use and were able to determine that being married is protective against binge drinking and that individuals with a family history of alcohol problems are at the highest risk for binge drinking.

Alcohol use is problematic among young adults. Military personnel are at particular risk as they transition from the parental environment to one in which they must begin to assume responsibility for their own choices and behavior, and one that normalizes alcohol use. Reducing the prevalence and frequency of heavy drinking among military personnel would result in considerable harm reduction, increased capacity for rapid mobilization, and safer military communities. As shown in our preliminary results, the MI interventions tested in the present study resulted in significant decreases in heavy alcohol use.

In moving forward, these brief MI interventions could be more widely applied in social marketing techniques to the broader military population. Clearly, the development of effective primary and secondary prevention strategies should be based on methodologies that have a firm foundation in theory and preliminary research support. The present study encompasses an innovative, theoretical approach to providing an intervention for use with problem drinkers.

Appendix B: Statement of Work

Revised Statement of Work

Title: Motivational Interventions to Reduce Alcohol Use in a Military Population

PI: Janice M. Brown, Ph.D.

- Task 1.* Obtain Study Approvals, Months 1–24
- Prepare and submit RTI Institutional Review Board (IRB) materials.
 - Prepare and submit regional and/or individual base IRB materials to the Air Force.
 - Prepare and submit Ft. Detrick Human Subjects Research Review Board (HSRRB) materials.
 - Conduct study briefings at all participating Air Force bases.
- Task 2.* Prepare Computer Assessment, Months 1–6
- Purchase study computers.
 - Program computer assessment.
- Task 3.* Conduct Motivational Interviewing (MI) Training of Alcohol and Drug Abuse Prevention and Treatment (ADAPT) Staff, Training of Tape Coding Staff, Months 7–9 and ongoing as new bases join the study
- Prepare intervention manuals.
 - Conduct MI training of ADAPT staff at RTI.
 - Send PI and data manager to the Center on Alcoholism, Substance Abuse and Addictions (CASAA) in Albuquerque for intensive tape coding training.
 - Hire tape coding staff.
 - Conduct training of tape coding staff at RTI.
- Task 4.* Pilot Assessment, Months 10–22
- Set up computers at Air Force bases.
 - Conduct pilot test of instruments at one Air Force base.
 - Ensure seamless data collection for Air Force assessment tool and web-based assessment.
- Task 5.* Participant Recruitment, Months 22–52 (Data collection period extended to allow for an adequate number of participants to test for effectiveness)
- Begin participant recruitment and continue until complete (N=675).
 - Transfer Air Force baseline assessment data to RTI.
- Task 6.* Booster Training for MI Counselors and Tape Coders, Every six months, Months 22–48
- Conduct booster training sessions for MI counselors to ensure treatment integrity.
 - Conduct booster training of tape coders at RTI to ensure coding consistency.
- Task 7.* Follow-Up Assessment, Months 25–55

- a. Contact study participants for follow-up assessment.
- b. Conduct 3-month follow-up assessments.

Task 8. Treatment Cost Assessment, Months 25–52

- a. Develop tailored cost analysis instrument with input from Air Force treatment personnel on definitions and structure of instrument.
- b. Collect cost data at the Air Force bases from treatment personnel.
- c. Calculate costs per client from raw cost data.

Task 9. Follow-Up Assessment, Months 28–56

- a. Contact study participants for follow-up assessment.
- b. Conduct 6-month follow-up assessments.

Task 10. Follow-Up Assessment, Months 34–60

- a. Contact study participants for follow-up assessment.
- b. Conduct 12-month follow-up assessments.

Task 11. Data Analysis, Months 24–60

- a. Conduct analysis of baseline data.
- b. Conduct preliminary and final analysis of 3-month data.
- c. Conduct preliminary and final analysis of 6-month data.
- d. Conduct preliminary and final analysis of 12-month data.
- e. Conduct longitudinal data analysis.

Task 12. Report and Manuscript Preparation, Months 12, 24, 36, 48–60

- a. Prepare and submit annual reports.
- b. Prepare conference presentations, beginning in Year 2.
- c. Prepare and present final briefings for participating Air Force bases.
- d. Prepare manuscripts and submit for publication.